



physiological saline or a buffer substance, to the vaccine compositions obtained.

Administration of the vaccine compositions obtained according to the invention may be performed by all the routes customarily used for the administration of vaccines, and in particular by the subcutaneous or intranasal route. It is also possible to choose a different route for the primary immunization and the booster immunization.

It is possible to administer separately the composition comprising the antigen and the composition containing the amphipathic compounds according to the invention; however, the administration of a liposomal composition of amphipathic compounds according to the invention combined with the antigen makes it possible not only to increase the humoral type immune response, but also to induce specific cytotoxic T lymphocytes.

A better understanding of the invention will be gained on reading the non-limiting examples which follow, reference being made to the figures.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates the reaction scheme for the production of DC chol. Figures 2 to 6 depict the results of tests of induction of cytotoxic T lymphocytes for each group of mice mentioned in Example 8.

Figure 7 depicts the results mentioned in Example 11.

Figures 8 and 9 depict the results mentioned in Example 12.

Figures 10 and 11 depict the results mentioned in Example 13.

Figures 12 and 13 depict the results mentioned in Example 14.

5 Figures 14 and 15 depict the results mentioned in Example 15.

Figure 16 depicts the results mentioned in Example 16.

Figure 17 displays Table 1.

10 Figure 18 displays Table 2.

Example 1 : Synthesis of 3 β -[N-(N', N'-dimethylaminoethane)-Carbamoyl]cholesterol (DC chol)

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DC chol is synthesized by reacting cholesteryl chloroformate and N,N-dimethylethylenediamine according to the scheme in Figure 1, as described in the paper by X. Gao and L. Huang (BBRC 179 (1) : 280-285).

20 A solution of cholesteryl chloroformate (2.25 g, 5 mmol in 5 ml of dry chloroform) is added dropwise to an excess of a solution of N,N-dimethylethylenediamine 20 (2 ml, 18.2 mmol, in 3 ml of dry chloroform) at 0°C. After extraction of the solvent by evaporation, the residue is purified by 2
25 successive recrystallizations in absolute ethanol at 4°C, and dried under vacuum. 0.545 g of DC chol is thereby obtained in the form of a white powder. The structure of the compound was verified by NMR and mass spectrometry. The results obtained are in agreement with the data published
30 in the paper cited above.



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30 The titres of neutralizing antibodies in the mouse sera are presented in the form of \log_2 of the highest dilution inducing haemagglutination inhibition.